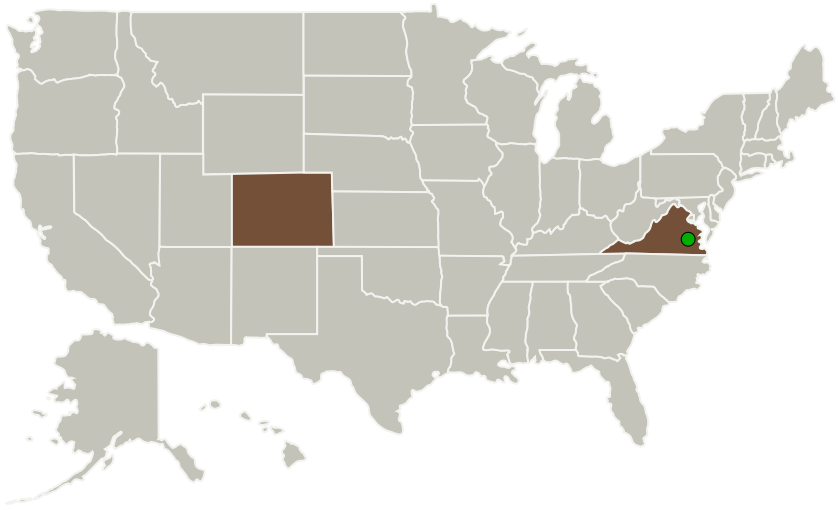
Lightweight Inflatable Cryogenic Tank, Phase I

Completed Technology Project (2011 - 2011)

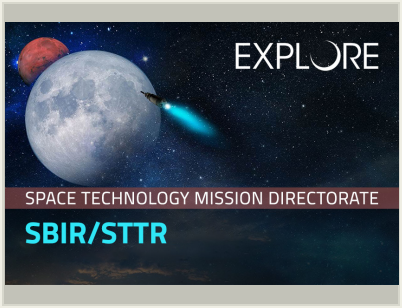
Project Introduction

This proposal describes the development of an inflatable and lightweight polymer-fabric structured pressure vessel designed for the containment of cryogenic fluids. Technology Applications, Inc. (TAI) in collaboration with the Thin Red Line Aerospace (TRLA) proposes to develop a cryogen tank design solution with fully determinate load paths that addresses the need for lightweight pressure containment at extremely low temperatures without the reliability issues that exist in composite tank structures. Ultra High Performance Vessel (UHPV) technology that has already been developed for many other applications will be extended for use into the cryogenic temperature operating range. The Phase I feasibility study encompasses the design and critical support elements for creating a robust lightweight cryogenic tank structure that meets NASA mission specifications. The Phase II program will involve fabricating and demonstrating the performance of a prototype cryogen tank based upon the inflatable UVHP architecture.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Technology Applications, Inc.	Lead Organization	Industry	Boulder, Colorado
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



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Primary U.S. Work Locations	
Colorado	Virginia

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Summary: Lightweight Inflatable Cryogenic Tank, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138250)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Technology Applications, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

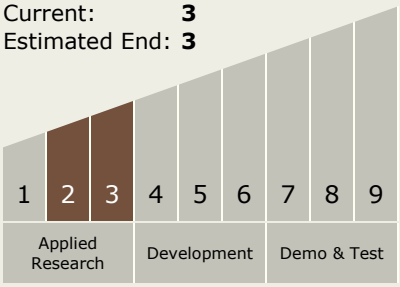
Carlos Torrez

Principal Investigator:

Stephen Nieczkoski

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.1 Lightweight Structural Materials

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System